Notebook, N-07-01-28.2

This notebook contains dated entries from the periods January 1907, June 1907, June 1911, and August 1912. All entries are by Edison. At the beginning of the book are instructions by Edison to F. W. Weber regarding the preparation of iron-tin compounds for storage battery experiments (see also N-07-01-28.1). Most of the book contains notes pertaining to the production and duplication process for disc phonograph records. The front cover is labeled "Dr. Weber 1907." The pages are unnumbered. Approximately 100 pages have been used.

Jany 28 1907

Dr Webber—

Dear Dr Grathes book—

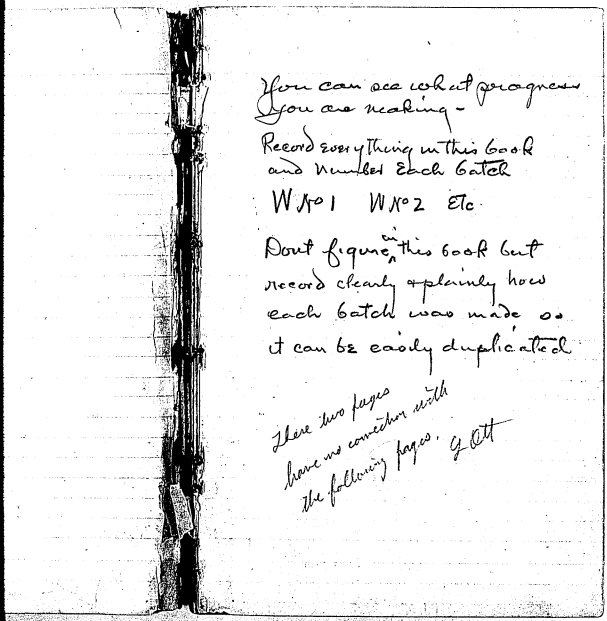
I want you to work on Iron Tin Mixture, 80 Iron 20 Tin—

Each sample shall contain 4 oz of dry mixture ready to Hyo to Silver Lake to be reduced Calythydrogen

½ of the sample will be reduced & self heated + 5% HgO added
The other ½ will be reduced so as to be Non pyrophoric + 5% of HgO added —

Two test pockets of each kind will be made & self heated upon pyro

The results sent to you so



You can see what progress you are making -

Record everything in this book and number each batch

W № 1 W № 2 Etc

Don't figure in this book but record clearly + plainly how each batch was made so it can be easily duplicated

These two pages have no connection with the following pages. G Bell

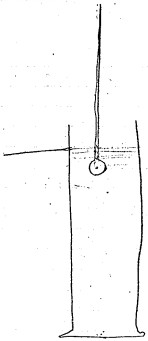
June 5 1907

Take a Solution of 21% KOH. ~~pot~~

dissolve 1 gram Aluminium to each 100 cc of KOH, —

Then take about 20 cc of the Solution. & Coil with - the following fresh precipitates — to see if Can precipitate out the Al_2O_3

1 Nickel Hydroxide —
2 Ferric 2 " use plenty Hydroxide
3, Bismuth 2 "
4 Manganous "
5 Manganic "
6 Antimonic "
7 Magnesium 2 "
8 Calcium "
9 Strontium " Ne Cost
10 Barium 2 "
11 Cadmium "
12 Copper "
13 Cobalt, "
14 Chromium 2 "



3% clay
5 "
8
10
15
20 %

Viscosity

Aug 17 1912

Experiments to produce a varnish on plates to transfer by heat & pressure to disc blanks — The trouble is air bubbles many microscopic these stay in + when in press under heat they expand when cool print records + when relieved of pressure many of them expand + throw up a small

2 pages over

June 28 1911 —

Varnish of Condensite on leaves —

50 grms Resin + Turpo
70 cc Denatured Al —
in following % each baked
Horizontal —

1.6 2 2.4 2.8 3.2
3.6 4 4.4 4.8 5.2
5.6 - 6 —

Sections on veneer varnished & dried

Aug 17 1912

principle, thus gives a crackle sound on record, so far we have tried about everything to eradicate these bubbles but so far have not succeeded,

We have poured the varnish on level plates with turned up edge but its very difficult to keep plate level when Centrifuge is supposed to be at speed, hence uneven varies in thickness In addition the discs when put on all in one day is takes a long

Aug 17 1912

time to dry — this ties up an enormous number of plates that it is absolutely necessary — to prevent this we are compelled to use a brush & put it on in 12 layers drying each layer 1/2 hour to permit Solvent to nearly Evaporate. It is the brush action which entangles Microscopic bubbles in the Lacquer — the rapid passage of the brush causes a vacuum to be formed at each end of bristle Microscopic in size & some quite large —

The lacquer is thick & poured on plate to Equal depth drying the thickness of 12 layers immediately forms a film on the surface as the air impedes through any

Aug 17 1912 7a8

further drying of the Solvent,

There seems but 2 ways out of the dilemma —

1st Spread it on in Say 12 layers get something as a substitute for a brush that will not produce air BUBBLES + also have the same action as a brush so that it will not be necessary for the plate to be flat after ward —

Or Spread it on in one layer + have plate reasonably flat + Evaporate the Solvent so there is no surface film formed

Experiments just Tried show that if the surface

Aug 17 1912

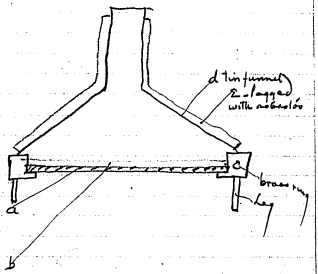
The
is kept surrounded with
an atmosphere saturated
with the solvent and
kept at a temperature 20
or 30 deg Fahr below
the boiling point of
the solvent no film is
formed & the whole of
the solvent can be
evaporated out without
producing blisters or
bubbles due to solvent

On pouring the is no bubbles
formed as at rule & if there
are they are of small
size and to be visible & can
be taken by flat tweezers
before baking

We are making this
preliminary Expts to shows
that it will probably
work

Aug 17 1912
TAE

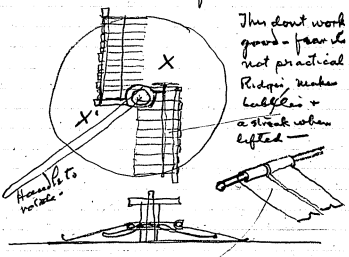
L



a — transfer plate
b varnish — whale is lowered, + poured at once. 80 cc — about
The whale put in oven & if Aldehyde is used kept at temp 120 at first, then 140, for several

Aug 17 1912
TWB

hours, then raised gradually to 225 — This brace can be used for Submarines —
If Commercial record views after 6z used —
Can put the lacquer on them



Tin or brass, Loose slips of proper weight the whole

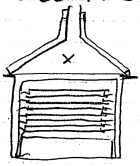
Aug 17 1912 TWE

device can be lifted away from the plate. This device acts as a brush but instead of dipping the brush in the lacquer the proper amount is poured on plate at X X' + these rotating leafs used as a spreader the viscosity of the solution is such that the weight of the leafs does not sink far in the lacquer it merely spreads it uniformly After the 1st spread it is air dried + then another dose is poured on + spread until the

Aug 17 1912

Proper number of layers is obtained after final drying the tab of red although on thick does not flow when subjected to low heat

A Crate holding 20 plates is put in a Closet Box & Covered thus



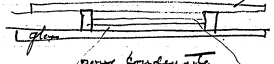
A large number are put in an oven & brought up to 100 120 Fahr for several hours the solvent vapor sulfide the films & the lower part of Box & funnel is in a warm saturated atmosphe

Aug 17 1912

703

of the solvent which gradually disappears up the chimney of the funnel – After the Solvent is Evap the heat is gradually run up to the boiling pt of solvent used there for Couple hours & then in 2 hours heat to 225 Fahr to harden the Condensite Varnish

While the apparatus is being made in substantial manner I try this

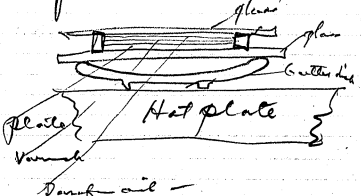


Layer of paraffine oil
another with - amyl alcohol

Aug 17 1912

over it – another with glycerin over it – idea being alcohol will dissolve in the dry glycerin or paraffin oil & keep film from forming of what if such should can be obtained without formation bubbles ——

The remaining liquid being poured off & edges of mat it cause quite thick & discarded the contents surface of plate & can be blotted free of the top liquids



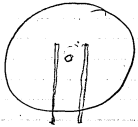
Aug 17 1912

74.

We have been try a lot of Expts on gold plating Double Mention of Condensite sub- Masters in Vacuum to get an Even Coating — also Expts to Evenly deposit Copper from Electrolytic Copper Bath, Evenly full over

To get even deposit of gold it is necessary to rotate the disc in Vacuo by a magnet outside rotating & dragging disc along with it —

The present way of using 2 gold strips, arranged thus —



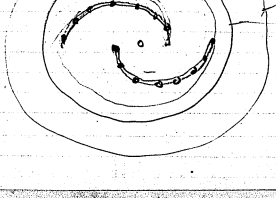
is unsatisfactory as the amount

Aug 17 1912

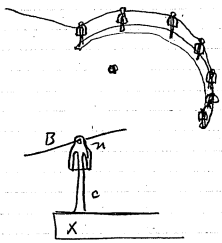
of gold strip to the area to be plated is not taken into account hence the deposit is heavy on inside or Center & very thin on outer surface - hence when we attempt to Coat the whole disc with Copper by Electro plating the resistance of the gold film being thin on outer surface & irregular the deposit is very slow & uneven - this leads to make a bad record surface giving surface noises. The bad spots are finally covered by it is covered by Creeping of the deposit & not directly as it should be & the gold was sufficiently thin to Conduct

Aug 17 1912

We use gold wires instead of sheets so as to raise the temperature by decreasing the surface causing the gold to metallize more readily at heat up the apparatus or wax dyes which is dangerous & We so arrange the total length of the wire that Each square inch of the white is as nearly as the same length of gold wire under it & that the same or as near as possible the same amount of gold



Aug 17 1912
7 of 7



X the S shaped glass rod-
C uprights with an end like an
ordinary telegraph wire
insulator the gold wire
being wrapped back from
these uprights — The

Aug 17 1912

object of the glass
insulator is to prevent
Electric Contact with
the gold surface formed on
the upright of glass S.
which at a certain stage of
the deposit helps to carry
the Current instead of
following the gold wire
thus reducing the temp
down heats up wire
+ produces gold deposit

The insulator inside gets
no deposit hence it breaks
Connection between the deposit
formed on glass + the
gold wire

The peculiar shape of the
position of the gold wire
is such that the length
of wire exposed + calculating
gold is the same per
square inch of area of

Aug 17 1923

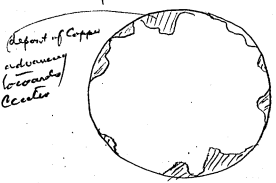
The wax dies —

After Each Operation the Uprights & other parts which have used a deposit is cleaned by Cyanide or aqua Regia & used again

The film of gold on the white wax is very fraible a soft brush moved over it while dry rubs it free of the wax hence the method of taking out the white gold Coated in wax putting it in a spider holder & winding wire around the edge

Aug 17 1912

is a very defective operation as the wire breaks the gold film & makes contact only in places — When we Coat with Copper it appears thus as the deposit advances



By cutting a groove on side of Quartz tube I could record thus

& winding No 36 Copper wire in the grooves several layers

Aug 17 1912
Jag

Before it goes in Vac the gold is deposited over these wires -

them when Mercury is put in Spider, an additional few turns of 36 wire is wound over the wires in the groove + Connected to the pole on the Spider. The Copper advances Evenly over the Edge + proceeds to the Center sometimes there are slight defects in the plating of the gold. and the copper does not deposit at first on this spot Making an Island so to speak = after it is beat that the copper should advance quickly towards the Center of which else should be covered quickly as the Electrolyte bath tends to attack the Wax there minute holes in the gold film

Aug 14 1912

724

to all amities resulted.

I use with a 10 inch disc

an anode on 2 inches

in diameter + place it

about 2 inches away from

the center of the wax tablet

at first + as the copper

advances towards the

center I put it closer

sometimes 1/2 inch —

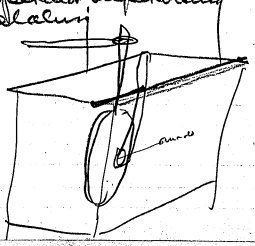
"

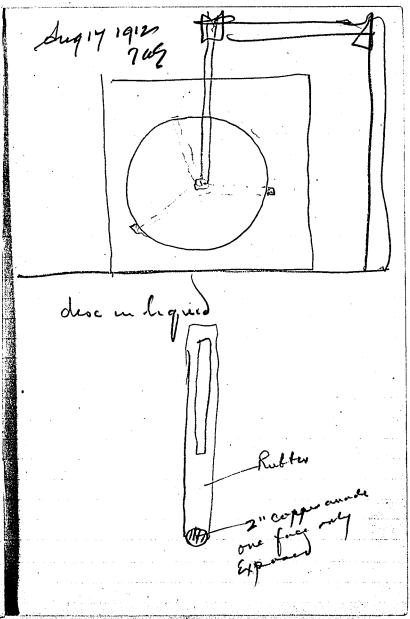
The anode is moveable

+ can be manipulated by

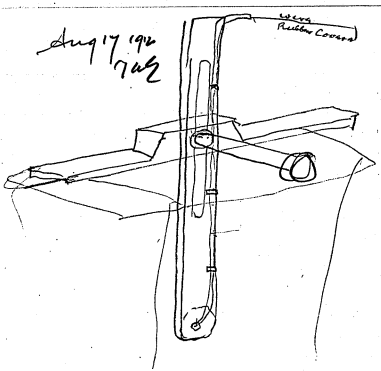
the Operator supervising

the plating

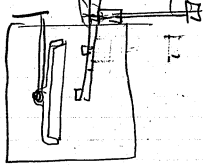



Aug 17 1912
disc in liquid
Rubber
2" copper annulus
one face only
Exposed

Aug 17 1912
7 a.m.



Anode moveable in every direction in front of the disc



Aug 17 1912

With this anode of a spot dont plate he moves the anode directly in front of it enormously increasing the Current density + quickly Coats it thin preventing any action of the solution.

After the wax master is Entirely Coated with the very thin layer of Copper it is transferred to the regular bath + rotated with a high density Current until the copper is about 40/1000 thick + then the wax Removed from the Copper Edges cut away + Mounted on a Brass Backing

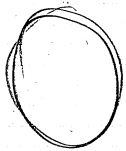
We have tried platinum with gold but the Res is high + it is not so good

Aug 17 1912 HAE

One of the principal objects of having a small anode is to prevent plating too much copper around edges + to advance the Cop Coating towards Center as fast as possible

We use 1 amp at first + when in about 1/2 to 3/4 inch use 1 1/2 amp + then when uncovered part is 4. to 4 1/2 inch then use 2 amperes.

We use 10 to 18 amp in 6 oz Cell for making the thick deposits



Aug 17 1912 709

The varnish in 2½ dia ring covered with paraffin oil + set on butter dish right on hot plate - was fully set + baked in 2 hours it had few bubbles but this is due to rapid baking at higher temp than BP of the alcohol its remarkably good—

This Expt shows that the alcohol goes into the oil + evaps from oil keeping surface of varnish free of the evaporous film

This is a fine Expt + WE can use it

Aug 17 1912 Tag

The varnish in ring Covered with amyl alcohol was Gelatin 2 hours is free of bubbles

Think it too soft yet - tried it - to cold but too soft = Think amyl alcohol dissolves in it

Glycerine is NG - colorless
Varnish - Muddy -

Amyl acohol sol in Ethyl al

BP 263 - so it can be mixed with Varnish + it would stay until all the Ethyl is off + Varnish hardened then it Camber Coat up + all the amyl driven off -

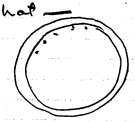
It seems strange that amyl al is the only substance

Aug 17 1912 Tues

that prevents frothing of Legumds when yeast is generated & that it also prevents bubbles in Condensate Varnish — ? ? —

As to Expensive the question is now what is the purest quantity that we can use —

Am trying Castor Oil film over the legumd Varnish it seems to run over it — when hot —



put it in hot place bubbles are coming out at Edges but not in general surface

Aug 17 1912 TLM

Castor oil dont work good - Wants a thinner Substance like Kerosene Prattts Cutting Oil probably —

3500 cc water —
100 cc of a 15% Solution of Kcy + 50 cc 4% Sol Hydrogen Perox dissolves gold from Vacuum gold depositing apparatus quite quick —
DE immerse the

Aug 17 1912 7:43

Whole of these apparatus
in liquid in few minutes
gold is entirely dissolved
We wash them in hydrant
water thoroughly &
then in distilled
water & dry -

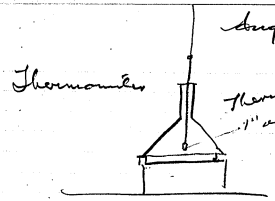
This solution will not
keep as Key dissolves
to Cyanate - If there
are several ready to
be cleaned think it
will clean 4 or 5

Aug 17 1912 MM

till it gets too slow—
It can then be thrown
away — after a while
we will pour it
from Zinc shavings
& save the Gel. C—

The poured plate in ring
with funnel over it
lagged with asbestos.
Had 80cc of No 7 Varnish
poured on it at 2.50 pm
at 7.30 it was set but
Color getting deeper dont
succeed as much alcohol
succeed phenol stronger
Have kept heat just over
the film 120. @ 140 limit

Aug 17 1912



No bubbles have yet appeared
I am raising the temp to
140 already — 9/10 of time
given at 12½ @ 120°

Not smelling any more alcohol
& the film tried soft makes
me believe we should have
a little more 6/4 & it would
have hardened at 140
Speak to Andrew to make a
bottle of No 8 Varnish
which is 807 with little
more 6/4 —
I believe the alcohol is all
Evap & now we have to
go higher to get hard
whereas if more 6/4 it
would be already hard

Hoffman –
Wakes Varnish.
Brush bldg

Aug 17 1912 Tues

After 5 hours it is probable that the film in funnel apparatus would remain soft for all time – I think its in a condition to harden + has been for 2 hours – its been on 6 hours – I am gradually raising temp to 150 to see if it will harden any – it is probably safe to go to 160 for short time for air bubbles but will keep it near 150 for a while 9 pm its 142.

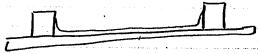
920 147 Fahr

945 152 Fahr – flowed to one end
952 154 " bubbles at Edges –
10 PM – 156 " fair on side full
1009 158 " bubbles 3 or 4 bubbles
1047 160 " 14 away in thick
1112 160 " part [illegible]
1120 160 " I find it red + hardened

Can't stick pencil in it at all hardens in 2 hours – after its been around 140 + gradually is raised to 160.

No bubbles can be seen—
This is 5 hours at 125° Fahr
30 minutes at 140 deg
15 " at 154
1 hour at 160— hard,
probably not hardened enough for transfer, therefore it could be brought up to 225°, in 3 hours more, making the whole process 12 hours.
As against 6 hours lacquering + air drying or 22 hours in oven + full of bubbles —

In the 2nd coat with small rings the varnish runs up on the sides— which is very bad this



I now grease the inside of the

ring with heavy [illegible] and five oil
sailcloth wings [illegible] blades
battering + it looks as if it
was going to strip it

We are now setting up a
varnishing table as I feel sure
the speed of the table is
altogether too high as on
160 [illegible] 180 - I think
it should be 6 or 8 per
minute The high speed I
think makes bubbles as
Vac formed behind the ends of
the brush bristles or hairs -
also the varnish is viscous
+ it pulls it along lapping
over & varnish previously
put on giving great chances
to trap air + make bubbles
I found this so with the
little tin flaps

Up all night Aug 18 1912
6 am — TKE

Varnishing transfer plate
with rubber is certainly
a tough proposition
Every scheme so far has
failed. Brushes, flood & oxes
fountain pen principle,
Sarapers etc. no —
Nothing Camel hair brush
perfectly flat plate dead
flawless coat of the scheme
work but is Comply
impossible to handle
many thousand plates
subject them to pressures
of 1100 Ton + keep them
flat —

We are now trying flowing
the same as we did the
plates flowed the
Carbodeed emulsion
over the glass negative,
by hand manipulation —

To make this work out
all had to add to

Aug 18 1912 7cm

No 7. Varnish of 50% wood alcohol

With 25 cc of this each time it can be flowed nicely = The first coat is hardest to flow as it dont wet plated good but Careful manipulation + drawing a splint over an isolated streak dont cover it gets nice coat The 2nd coat is much easier - and 20 cc will probably work ok. It one of the bottles Cap full within 1/16 of rim — I measure it by using from a cc Measure

On account of excess of alcohol film dries white but if fired When dried over hot plate at 125°F ahn it becomes transparent again.

Aug 18 1912

Its probable the water in the Alcohol when boiler mostly evaporate it leaves a great excess of water + this precipitate resin —

I have just given first Coat to 6 plates + put them in Aikens holder

have them over hot plate to dry 1/2 hour when I will give them a 2nd Coat

If 2nd Coat can be done with 20 cc

think possibly can be done with 15 cc

Later it can be done on 2nd Coat with 15 cc

Aug 18 1902 TMS

but I think 20 cc which
works fine + Easy will be
OK + it will only take
6 @ 8 or less layers to get
12/1000 when hardened

It is quite necessary that
Each coat should be dried
Enough so it is not soft
under film as in manipulating
the press Varnish by
anything the plate the
previous Coats are liable
to flow, this must not
take place think 1/2 hour
at 125 with plenty draught
will do the thick between
Each layer — There is no
hurry 3/3 3

Our main trouble now
is the removable Edge
around the plate as we
Cannot transfer in

Aug 15 1912 Tidy

a non flowing mould with a transfer plate having a metallic raised Edge,

Whether Can we use a Condensite transfer with a fin —

We propose making a removeable raised Edge + prevent leakage by a rubber tube, + when the Edge or rather the plate of Vermuch is removed the fin is to be filed off — this makes a rough Edge but as this is underneath it will do

no harm,

5 Hours sleep

Aug 18 1912

Found that the plate varnished by flowing that was left at 9.30 this morning was dry on top but still soft, to the air - 5" above hot plate with Bunsen on hot plate

This shows that when cleared at once some the phenol keeps it soft but its in good condition to flow more I expect — ½ hour at 120 is sufficient I think to dry film

sufficient to flow OK the other Coats —

I found that our No 7 varnish has quite a lot of fine specs which glisten on the plate when spread - It is possible these specs decompose at high temperatures + we got, fortunately in detuning the resin to get it to flow, we have got it thin Enough to filter thru fetter paper which

We are now doing:-

Thinking that the 5% water in the alcohol which is left behind after alcohol is evaporated produced bubbles when the temp got to 160 + above

We got a gallon of Absolute Ethyl Alcohol + decomposed to make Varnish with + instead of 95% Denatured found that the 6/4 hardner will not dissolve in it so we are up a stump + will have to flatten the water However I am certain we can use 97% which will help some

We have found that in Rowning by plate + manipulating to get it flowed over Even that a few bubbles now + then gets in Mechanically

We have found that this took placed over the bubble in the Varnish immediately after its flowed a before film formed work remove the bubble

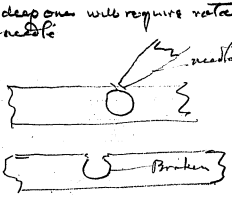
1/8 hole on suddenly lifting the viscosity of varnish is such that a portion with bubble is lifted + bubble bursts the Varnish on plate quickly fills the hole —

We also found that the hardened varnish has bubbles Even the best wile have 20 To 50 which is hope to get rid of altogether but can lessen transfers We have a girl go over the plates + open them Heh on pressing at high temp 320 to put transfer on blank The condensed flows into the

holes leaving only a circle very faint where the cuticle excluded the dissociation does not give out a sound when passing over

We use a needle with end ground to knife edge by pressing & turning the wall of the cuticle is broken

The deep ones will require retraction of the needle



boiling Acetone Benzol dissolve scarcely any 6/4 Ditto Amyl Alcohol but boiling Absolute Alcohol 100% dissolves very considerable

Probably enough for our work as the use of excess of alcohol

Smaller hot Carbolic acid also dissolves some 6/4 — which is in our favour —

50% of Alcohol added to Reg No 7 Warmish, filter nicely — but towards end filter paper gets closed about 8" dia of filter paper is OK for 250 cc of liquid — without getting slow —

There is an enormous amount of dust in No 7 as shown in a hardened transfer 25/1000 thick

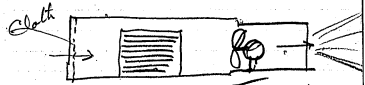
Under Meeros cape where there was only 2 flows — but undoubtedly a large amount of film collected in the room while 1st & 2nd Coats were drying —

These transfers while drying must be protected from dust as much as by using Imeus Conditioning for filter Chambers — Preemption room from dust as in Philpots dipping room —

We have rigged up to flow plates — let dope run from a closed reservoir into a measuring cup

which seems to be the most practical way [illegible] over it out on plate & Manipulate —

Took One of Aikens perforated holders & flowed 12 put them all in the holder & then put them in a box thus



Later 3 or 4 hours in they are still white thus between N.G.

They were in some 1 hour

Other ½ hour all were white —

Took one that has been in hour & put a 2nd flow on it, noticed that it became bright opposite every hole on the holding plate also that the surface of the white dope had sunk or raised Each day which opposite Each hole — Thus is funny It looks as if this device is a poor drier — and that the open air may be better, I noticed two I made & put in open air after being white turned transparent & probably within a hour although not certain of time

We flowed plate with No 7
Made with Cellosolve Ethyl
+ deluted 50% added also
of Cellosol Ethyl, It seems
dry quicker as it had
difficulty in flowing
20 cc — Dried in pair
it only shows a little
white at Edges

all the balance Keep
clear — its very transparent

seems to act a little diffrant
We flow another place
apart it under Bell jar -
with 4 dishes filled
with Strong H_2SO_4 to
absorb the alcohal
to form Sulphovinic
acid + also the water
+ dont turn white —

flowing a plate with
20 @ 22 cc of N°7 dil with
50% Alcohal, dont turns
white then in 2 hours +
10 minutes is transparent

and ready to flow 2nd Coat
2½ hours would Go Better.
It was out in the air —
of room - no wind —

Think they will have to Go
dried in Levelled racks in
large room —

Tried adding lot of water 15
80% and the alcohol I used
to dilute 50% — Sol clear
but on flowing it turns
white + Resin coats

Its the rapid evap of the ~~Resin~~
Alcohol & rapid increase
in proportion of the water
that makes it turn white.

We flow 3 plates with
20 @ 22 cc of 10% with 50%
absolute
Ex. Alcohol put them
6" above steam plate
Thermometer stuck in
Center hole of one
of the plates
shows 115° @ 120

degrees — 45 minutes
was sufficient to
permit 2nd flow without
dissolving 1st Layer —

45 minutes after we
made the third flow —
They look very nice
Grey percaine Cuticle
Remover took off with
glass point
Absolute Ethyl not removed
is clearer only slight
yellow tinge on 3rd Coat

Think 1 hour over hot plate or with hot air at 115 @ 120, that as many coats as desirable can be put on plate

We flowed a plate + placed it in front of a blower on table fan in 5 minutes it turned white in a few minutes more turned transparent again - this shows

Arkens oven

4 hours	120	Fahr
4 "	140	
6 "	160	
2 "	200	
4 "	220	

rapid drying at ordinary temp —

I found by using XOY diluted with equal quantity of Alcohol that the layer is much thinner with 20 cc, and that it dries hard = This gives us another chance to solve the problem but at considerable expense for alcohol

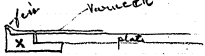
It would reduce the bubbles to small dimensions - as the liquid comes limpid there will be less formed,

Last night the 3 plates that were given 5 coats & dried 40 minutes 6" over hot plate. We made the mistake of bringing them hot from the plate to flow them — We should have set them on a chilling plate to cool Celoco atmosphere then the whale gets much harder — the new varnish will not attack or soften the old varnish —

We gave the 3 plates with 5 Coats to Ackers man to bake as per schedule on last page also one of Moores plates for Grimes There is a fin on it

fin —

Here is a new scheme to stop the fin —



As the varnish is soft before final bake the plate is forced

out of ring X. leaving the fin on ring — then when baked there is no fin — Moore Making it —

1st Layer. Abraded all diluted Denatured

Heat plates on 2 hours 15m Coat plates have been 1 hour 2nd Coat on 5 & 3 — Thin Coat used all diluted Denatured — 3rd Coat 6.30. on. 6 plates —

I note that the ray made with 95% coaad alcohal is much thinner than with Denatured — I added the Excess of 50% of Denatured — I do not doubt but that if it was diluted with Coaad al instead Denatured it would be thinner yet — It filtered fast

I will make up a batch of 707 wood alcohol & Dilute it with wood alcohol think I can use 15 @ 18cc at time instead of 20 @ 22cc & then get better & quicker drying — Especially as Wood alcohol has lower boiling point — & I guess can get it absolute for few cents more gallon — & it has no denaturing Unknown substance in it which possibly gives trouble ——

Bad flow on the 6 plates dont describe the previous coats Except in one case where it was thicker on one side plate not having Even level

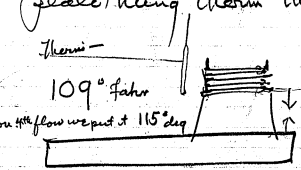
40 Minutes at a point over hot place where Thermo shows 115 @ 120 is ok for the work

The one with wood alcohol
colour is about 4 deep red
while that from Denatured
is light red —

with wood alcohol in 107
& Denatured for 50% dilution

The next batch we will
try 30 min & all wood al
107 filled —

to actually see what
the temp of the air is
Coming up from steam
plate using therm this



plates are 9/16 apart

bare plate on Top — 6 flows
plate —

5th & last coat on — practically there is no dissolving of the previous coats, if 50 min a Certainly 1 hour with air at 115 @ 120, the coats will be dry enough so now attack on previous film or flow of same underneath if Operator is expert in Covering & liquid is proper thinness —

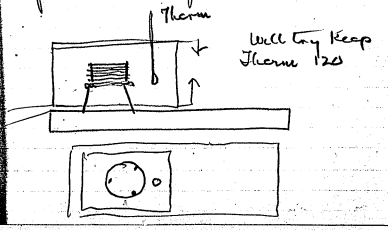
We will have Aitken Load these in OVEN tomorrow for regular baking

The plates look very nice

Aug 19 1912 TAE

We now use #07 Varnish made with 95% Wood Alcohol 50% additional of wood alcohol filtered,

Varnish & plates flows fine, 22 @ 24° first coat,



An extra plated flowed & left on bench quickly turned white

think we can dry in 30 mins: but allow 35 the Extra 5 for chilling when we left box on after flowing — 22@23cc used each time — We cool off before flowing it covers without affecting previous film —

Notice this lot at 35 with box around & 120 dont dry as quick as the other lot in the open & 115 deg in 40 minutes —

Think good circulation of warm air in the oven is best - 40 minutes is about right When 6 are in crate & 3 washers apart & blank on top —

We have just made another Crate using 22@23 cc all wood alcohol 50% additional — & will leave it on table no heat Room temp 76 Fahr

Tried Expt using undiluted #07 + using enough of following to make it flow good 23 cc

Camphor Oil NG expt out

Vaseline Don't mix

Carb Tetrachl – No advantage

Sassafras Oil. NG —

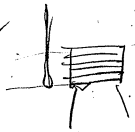
Benzol, works OK —
Could use this to dilute in place of alcohol if any advantage —
I can see none as far as gone —

The 6 plates in box Oven
Hot plate just finished
flowing 5th + last flow.
Last two a little soft +
show signs of wrinkling as
I angle the plate to pour
This shows that 35 mm
is not Enough —
To make it perfect, it
should be in 1 hour
In open box untouching
the hot plate, then the
flowing will be
perfect,

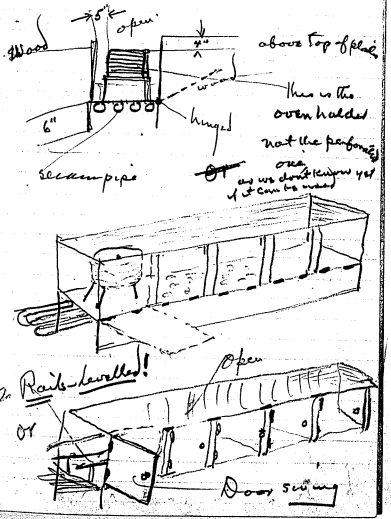
Thermometer

showed shown 120

hung



Aiken Comm. up this



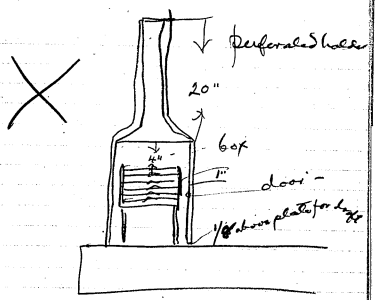
A Crate of plates with 5 plates 4 ft away from a Elec fan blowing them is after $1\frac{3}{24}$ hours still mostly white, showing Clearly that the plates Manuscript Must be Warmed as well as have a draft of warm air to stop chilling due to Evaporation,

I have been supposing all along that I might be using 20@ 72 cc I now find that I use 20 cc & never more some time less for each flow—

Either Denatured or wood alcohol may be used don't see much difference if there are any the all wood 95% is the best as it appears to be a better Solvent Thinner & flows well,

We Now try drying over oven at 120° - with 9 plates in the perforated Holder - set over hot plate - flowed with 20cc of 10% 50% Ex Celsolv 40 minutes drying - Thus is NG = Only bottom gets warm. takes hour 1/2 before white disappears Am making a box

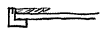
Thurs



Jig to Cut out every other plate — + Cut away some of the remaining plates

The 5th Coat 20cc Dilute No 7

on Grimes plate in ring — forced out leaving no fin



Was baked at 120 130 150 160 & finally rather rapidly to 220 had 2 large bubbles 1/16 dia broken — You could see the plate. There were about 10 other small bubbles the tops appearing above general level running finger over broke the exceedingly thin shell & apparently it went to bottom.

We had the therm 1/2 above the varnish suspended in the funnel over iron plate on sand bath, the bottom of transfer plate being 3½ inch from iron plate on sand & surrounded with Tin ring lagged with asbestos

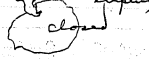
Possible the plate got heated very much higher than allowed than Therm showed as there was a draft between funnel + plate

This should be attended to next time + therm put in contact with plate underneath -

~~Also~~ WE had this Transferred to Submarine - One of the large holes is entirely closed except a faint dust ring

This will make no sound

The other hole had a Phenol Serpent.



Evidently the Cementum Varnish squirted from and made the Pharoah Serpent,

Aug 20 1912

Nicolai Cut out Each alternate perforated plate in plate holder also Cut out some of Each plate

We can put 10 plates in now & we have just made the finest flow

Note 5 5 Note

Dehydrated Resin
Dehydrated higher
than Reg- When diluted
with 50% more denaturant
is very light not used
& it filters Very Very Slow
totally unlike Regular
Later - When I use Wood alcohol
to dilute it follows OK & fast.

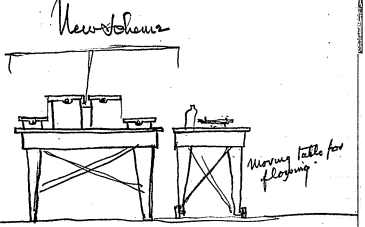
There is some cork got into
Varnish from Cork bottles -
We abandon Cork & hereafter
use glass — No more
Cork to be used in factory
for handling Varnishes
The Oven over hot plate
is blocked & leaf back
Fred Ott is filling the Varnish
over again & putting it
in glass Stopper bottle
We are going to try &
Keep them at 120 & bake
40 minutes, taking out

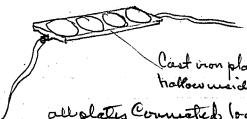
Crates + cooling before flowing varnish —

The perforated Crates are not level + I cannot see that it will be practicable to ever make + keep them level = The box scheme don't work even — bottom plates too hot Condenser forms red opal. rosettes — Heat too sudden It don't look practical —

We have measured thickness of one flow after it dried + have + have no softness to [illegible] about 3 @ 3½ [illegible]

Think 3 flows is ok for Conical blanks —





all plates Connected together with warm water Circulation from if necessary, at 110 more or less die plating level,

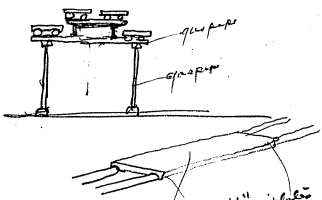
1 Man flows 100 hour – 3 flows.

3 hours, Makes 300 completed plates in 10 hours – or 150. Records

This requires Table to hold 100 plates, 4 plates to foot makes table 25 ft long 4½ ft wide – with 6 ft Aisle 10½ ft Centers. Con flow might 4 day so Each table gets 1300 Records daily 20 hours –

for 3000 daily 10 tables required

½ of width of building + 100 ft long

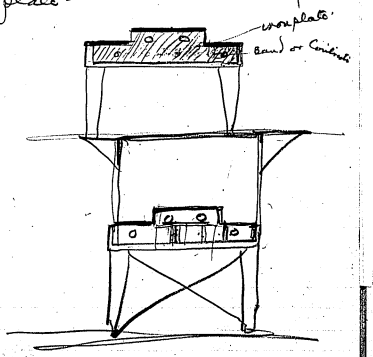


Hot water 100@110 –

We find that with 20 cc flow and steam plate 100 Fahr no white ferns and that w 20 minutes it can be flowed on 3rd flow there is a slight streak showing film underneath

was slightly affected —
25 minutes it would be
perfect —

Here is a simple heating
plate -

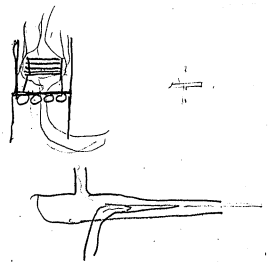


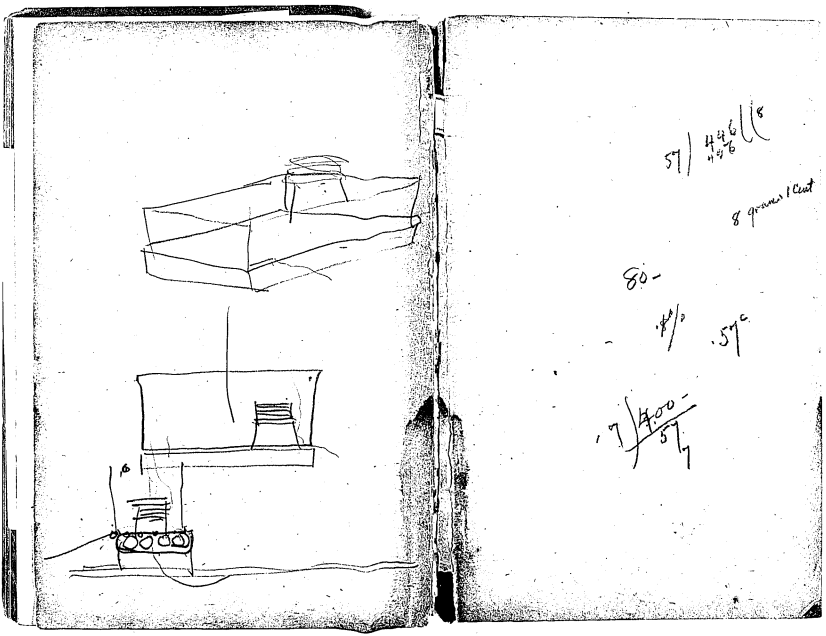
plates dried on Eleven plates at 115 deg all right in 20 min.

Except those plates that are not flat there 20 min is too short the film is devalved by the 4th point

plate about lay flat except one half —

To Obviate this defect 30 minutes will be required to make sure




57 | 4 4 6 6 | 8
8 grams | Cent
80-
.57c
.57 | 4.00 -